Notice of Allowability	Application No.	Applicant(s)
	10/644,073	ZHU ET AL.
	Examiner	Art Unit
	Carol S. Tsai	2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/21/05*.

2. ☒ The allowed claim(s) is/are *1-19*.

3. ☒ The drawings filed on *18 August 2003* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-19 are allowed.

2. The following is an examiner's statement of reasons for allowance:

U. S. Patent No. 5,862,513 to Mezzatesta et al. is the reference closest to the claimed invention. Mezzatesta et al. disclose a method for producing synthetic tool responses for a well logging tool for earth formation parameters, comprising the steps of: a) acquiring an initial set of data for a number of points or areas in a formation using a wellbore logging tool; b) producing a set of models or "training set" for the formation based on the original set of wellbore logging data for a single or multi-layer formation; c) introducing an earth model or "input model" from the training set to an artificial neural network (ANN) to produce an output of predictive synthetic tool responses for a particular well logging tool; d) comparing the output synthetic responses to theoretical responses and/or actual responses associated with the particular initial earth model to determine the amount of mismatch; e) and repeatedly comparing the output to the associated tool responses for the particular input model until an acceptable trained ANN is obtained. However, Mezzatesta et al. do not teach a method of predicting behavior of a characteristic of an electric submersible pump application, comprising: a) generating a training data set comprising data representative of an electric submersible pump application, the data related to at least one predetermined characteristic of the electric submersible pump application; b) establishing an initial neural network model for the electric submersible pump application, the neural network model related to the at least one predetermined characteristic of the electric

submersible pump application; c) using the training data set by the initial neural network to create a predictive model of behavior of the at least one predetermined characteristic of the electric submersible pump application; d) obtaining measured electrical submersible pump application operational data; and e) adapting the neural network using the measured electrical submersible pump application operational data to create a predictive model of behavior of the at least one predetermined characteristic of the electric submersible pump application; and including all of the other limitations in the respective independent claims.

U. S. Patent No. 5,862,513 to Mezzatesta et al. is the reference closest to the claimed invention. Mezzatesta et al. disclose a system for modeling behavior of a electric submersible pump application, comprising: a) a computer; b) a data store operatively in communication with the computer; c) a training data set comprising data stored in the data store, the training data set related to behavior of a well logging tool for an earth formation; d) a source of measured data for the well logging tool for an earth formation operatively in communication with the computer, data from the source of measured data being storable in the data store; and f) a neural network model of the well logging tool for an earth formation, the neural network resident in the computer, the neural network able to utilize the training data set and measured data to manipulate a model of the submersible electrical pump application. However, Mezzatesta et al. do not disclose using output of a neural network for validation and a software modeler adapted to provide a learning stage, where the learning stage comprises modeling a behavior of an electric submersible pump application using at least one deterministic mathematical algorithm based on engineering and physics principles that model the behavior of an electrical submersible pump application, providing the training data set to an initial neural network, and creating a neural

network model of a predetermined characteristic of the electric submersible pump application.; and including all of the other limitations in the respective independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. W. Tsai whose telephone number is (571) 272-2224. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax number for TC 2800 is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (571) 272-1585 or (571) 272-2800.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 872-9306. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the

examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. W. Tsai
Primary Examiner
Art Unit 2857

04/27/05